Amendments to the Claims

1. (*Currently Amended*) A device ~~(1)~~ for on-chip magnetic resonance measurements for use with a first orienting magnetic field, the device comprising a chip, said chip comprising,

[[-]] on-chip means for creating a second electromagnetic field to excite precession of oriented spin magnetic moments ~~(11)~~ in a sample ~~(9) to be analysed,~~ to be analyzed, and

[[-]] at least one magnetic sensor ~~(4)~~ for on-chip detection of a magnetic precession of the spin magnetic moments ~~(11)~~ about the first orienting magnetic field ~~in the sample (9) to be analysed~~ in the sample to be analyzed.

2. (*Currently Amended*) ~~A device (1) according to claim 1,~~ The device according to claim 1, wherein the magnetic sensor ~~(4)~~ is a magneto-resistance sensor.

3. (*Currently Amended*) ~~A device (1) according to claim 1 or 2,~~ The device according to claim 1, the chip ~~laying~~ lying in a plane, wherein said on-chip means for creating a second electromagnetic field and said magnetic sensor ~~(4)~~ are positioned adjacent each other in the plane of the chip.

4. (*Currently Amended*) ~~A device (1) according to claim 1 or 2,~~ The device according to claim 1, the chip ~~laying~~ lying in a plane, wherein the means for creating a second electromagnetic field comprises a conductor (3) adjacent the magnetic sensor (4).

5. (*Currently Amended*) ~~A device (1) according to claim 1 or 2,~~ The device according to claim 1, the chip ~~laying~~ lying in a plane, wherein the means for creating a second electromagnetic field comprises two conductors (3), each of the conductors (3) being positioned adjacent one of two opposite sides of the magnetic sensor (4) at a same position with respect to the plane of the chip.

6. (*Currently Amended*) ~~A device (1) according to any of claims 1 to 5,~~ The device according to claim1, further comprising a first orienting magnetic field generator ~~(6)~~ external to the chip.

7. (*Currently Amended*) ~~A device (1) according to any of claims 1 to 5,~~ The device according to claim1, wherein said chip furthermore comprises an on-chip first orienting magnetic field generator ~~(6)~~.

8. (*Currently Amended*) ~~A device (1) according to claim 7,~~ The device according to claim 7, wherein said chip has two major surfaces opposite each other, the means for creating a second electromagnetic field and the magnetic sensor being located on a first major surface and the on-chip first orienting magnetic field generator ~~(6)~~ being positioned on the second major surface.

9. (*Currently Amended*) ~~A device (1) according to any of claims 6 to 8,~~ The device according claim 6, wherein said first orienting magnetic field generator (6) is a permanent magnet.

10. (*Currently Amended*) ~~A device (1) according to any of claims 6 to 8,~~ The device according claim 6, wherein said first orienting magnetic field generator ~~(6)~~ is an electromagnet.

11. (*Currently Amended*) ~~A device (1) according to any of claims 2 to 10,~~ The device according claim 2, wherein said magneto-resistance sensor ~~(4)~~ is a GMR sensor.

12. (*Currently Amended*) ~~A device (1) according to any of claims 2 to 10,~~ The device according claim 2, wherein said magneto-resistance sensor ~~(4)~~ is a TMR sensor.

13. (*Currently Amended*) ~~A device (1) according to any of claims 2 to 10,~~ The device according claim 2, wherein said magneto-resistance sensor ~~(4) has an elongate strip~~ has an elongated strip geometry.

14. (*Currently Amended*) ~~A device (1) according to any of claims 6 to 13,~~ The device according to claim 6, wherein the first orienting magnetic field generator (6) comprises means to vary a magnetic field strength.

15. (*Currently Amended*) ~~A device (1) according to any of the previous claims,~~ The device according to claim 1, wherein said spin magnetic moments are nuclear spin magnetic moments.

16. (*Currently Amended*) ~~A device (1) according to any of the previous claims,~~ The device according to claim 1, wherein said spin magnetic moments are electron spin magnetic moments.

17. (*Currently Amended*) ~~A device (1) according to any of the previous claims,~~ The device according to claim 1, wherein said spin magnetic moments are coupled-spin magnetic moments.

18. (*Currently Amended*) A method for performing on-chip magnetic resonance measurements, the method comprising:

[[-]] orienting spin magnetic moments inside a sample ~~(9)~~ in a first orienting magnetic field,

[[-]] exciting precession of said spin magnetic moments ~~(11)~~ inside said sample ~~(9)~~ to be analysed, and

[[-]] on-chip detecting of spin magnetic moments precession ~~by means of a magnetic sensor (4)~~.

19. (*Currently Amended*) ~~A method according to claim 18,~~ The method according to claim 18, wherein on-chip detecting of spin magnetic moments precession ~~by means of a magnetic sensor (4)~~ is performed by a magneto-resistance sensor.

20. (*Currently Amended*) ~~A method according to claim 18 or 19,~~ The method according to claim 18, whereby generating the spin magnetic moments in the first magnetic field, is performed by the first magnetic field being generated external to the chip.

21. (*Currently Amended*) ~~A method according to claim 18 or 19,~~ The method according to claim 18, whereby generating the first orienting magnetic field is performed by a magnetic field generator ~~(6)~~ integral with the chip.

22. (*Currently Amended*) ~~A method according to any of claims 18 to 21,~~ The method according to claim 18, whereby exciting precession of spins ~~(11)~~ inside a sample ~~(9) to be analysed~~ to be analyzed is performed by generating a second magnetic field.

23. (*Currently Amended*) ~~A method according to any of claims 18 to 21,~~ The method according to claim 18, whereby exciting precession of spins ~~(11)~~ inside a sample ~~(9) to be analysed~~ to be analyzed is performed by sweeping the second magnetic field ~~over a frequency and/or amplitude range~~ over at least one of the following: a frequency range, an amplitude range.

24. (*Currently Amended*) ~~A method according to any of claims 18 to 23,~~ The method according to claim 18, furthermore comprising sweeping the first orienting magnetic field ~~over a frequency and/or amplitude range~~ over at least one of the following: a frequency range, an amplitude range.

25. (*Currently Amended*) ~~A method according to any of claims 18 to 24,~~ The method according to claim 18, whereby said sample ~~(9)~~ comprises different types of magnetic particles or molecules.

26. (*Currently Amended*) A method according to claim 25, whereby said on-chip detecting of spin magnetic moments precession ~~by means of a magnetic sensor (4)~~ comprises detecting separate signals originating from different types of magnetic particles or molecules.

27. (*Currently Amended*) ~~Use of the device as claimed in any of claims 1 to 17~~ Use of the device as recited in claim 1, for biological sample analysis or chemical sample analysis.